

---

**Landscape  
Development  
Interventions**



## **Cyclone Recovery Program**

**Final Report Tranche II  
From January 2001 to December 2002**

---

CONTRACT Nº : 687-C-00-98-00160-00

SUBMITTED TO : USAID/Madagascar/SO3  
SUBMITTED BY : Chemonics International  
LDI – USAID

December 2002

# TABLE OF CONTENTS

## TRANCHE II

<b>Overview .....</b>	<b>2</b>
-----------------------	----------

### Technical reporting

<b>1. FIANARANTSOA.....</b>	<b>3</b>
-----------------------------	----------

Success stories .....	3
-----------------------	---

Lessons learned.....	4
----------------------	---

1.1 Rehabilitation of Productive Infrastructure and Systems .....	5
---	---

1.1.1 Irrigation infrastructure rehabilitation .....	5
--	---

1.1.2 Seed Distribution.....	6
------------------------------	---

1.1.3 Community based FCE rehabilitation .....	7
--	---

1.1.4 Disaster Preparedness and Response Planning.....	7
--	---

<b>2. MORAMANGA .....</b>	<b>12</b>
---------------------------	-----------

Success stories .....	12
-----------------------	----

Lessons learned.....	14
----------------------	----

Impacts.....	14
--------------	----

2.1 Rehabilitation of productive infrastructure and systems .....	15
---	----

2.1.1 Irrigation system rehabilitation .....	15
--	----

2.1.2 Construction of agricultural supply centers .....	16
---	----

2.1.3 Seed Distribution.....	16
------------------------------	----

2.2 Disaster preparedness and response planning .....	16
---	----

<b>3. Summary of Second Allotment FRC funding Fianarantsoa and Moramanga.....</b>	<b>17</b>
---	-----------

<b>4. Financial Reporting .....</b>	<b>18</b>
-------------------------------------	-----------

4.1 Intervention Fund .....	18
-----------------------------	----

4.2 Table of Recapitulation .....	20
-----------------------------------	----

## OVERVIEW

This is the final report of activities implemented under the Cyclone Recovery Program (Tranche II), covering the period from January 2001 through December 2002.

The Cyclone Recovery Program (CRP) has reached all targets and in some cases has achieved results beyond contractual indicators. The CRP moved ahead rapidly, according to schedule, and has generated strong impacts in both regions. Three specific features of this program deserve to be emphasized, because they are the main factors behind the successful implementation of the CRP:

- First, we were able to initiate our work swiftly and efficiently, since LDI teams were already in the field and had identified rural infrastructures severely damaged by cyclones Eline and Gloria in our zones of intervention. In many cases also, the regional teams were assisting farmers with whom LDI has established solid foundations of mutual trust and respect, and who are members of Kolo Harena associations. It was thus easier to mobilize them through a participatory approach without hampering the timely implementation of our activities.
- Second, we have decided to rehabilitate irrigation systems whose costs are quite low, around \$150/ha, so that we can meet our targets and maximize the impact of cyclone funds. This amount represents less than 25% of rehabilitation costs usually considered as normal by donors such as the World Bank or the European Union. Once again, this was possible because of our presence in the field, our ability to spot key systems where we could have the best use of cyclone funds, and our good relationships with governmental institutions and other partners.
- Finally, the CRP has created remarkable opportunities for productive synergies with LDI regular activities. Both contribute to revitalize the rural economy and protect the environment in most damaged zones of intervention. While activities under the CRP are physically well identified, they are often closely associated with other forms of technical, financial and material assistance provided by LDI to small farmers in damaged areas. Therefore, their effects are considerably multiplied because of those mutually reinforcing interactions. For instance, seeds bought with cyclone funds are distributed through Agricultural Input Supply Centers managed by farmer associations assisted by LDI. In Fianarantsoa, Kolo Harena Federations, on their own initiative, decided to recycle CRP funds in order to purchase 95 weeding machines and NPK fertilizers. In the Moramanga region, the “Gouvernorat” of Toamasina was persuaded by the LDI Program approach and agreed to co-finance the construction of the 4 agricultural input supply centers to enable farmers to have access to improved seeds, credit and extension services provided through LDI regular activities.

The program greatly exceeded its original targets. The table below shows the main accomplishments compared to original targets:

INDICATORS	TARGETS	ACHIEVEMENTS
Number of hectares of irrigated systems rehabilitated	3,178	3,178
Number of tons of short-cycle seeds distributed to farmers	124.8	124.8
Number of farmer associations assisted	108	101 AKH and 24 AUE
Number of beneficiary families	1,550	3,476
Number of agricultural input supply center constructed		4 <sup>1</sup>
Number of communes assisted in Disaster Preparedness and Response Planning		30
Number of FCE Community-based component members		158

The main lessons learned from the cyclone rehabilitation program are as follows:

- LDI integrated the cyclone rehabilitation activities into its regular activities as it they were part of the entire program. The rehabilitation of infrastructures in the same ZSI was an important factor in the success of the program, which permitted the project to implement a series of activities, including irrigation of perimeters, construction agricultural input supply centers, and the development of community response plans. If the cyclone activities had not been integrated with LDI's regular activities, these achievements would not have been possible.
- It is necessary to always include a component that addresses the rehabilitation of infrastructure in all rural development projects if the project's objective is to reduce poverty while preserving the environment.

## TECHNICAL REPORTING

### 1. FIANARANTSOA

The Cyclone Recovery Program reached its final phase with the final acceptance of the rehabilitated works remaining in Tolongoina. Most of the indicators were achieved at 100% except for short cycle seed due to lack of budget. The implementation of cyclone response plans and the technical supervision of Water User Associations (AUE) continue with financing from the regular program. The last 2 years proved that the technical and organizational experience gained by the LDI regular program and the synergy with the recipients were key to the success of the interventions of the cyclonic program.

### SUCCESS STORIES

#### **Kolo Harena Federations recycled CRP funds to purchase farm equipment and agricultural inputs.**

The receipts generated by seeds totaled MGF 63 million in the coffers of the 6 Kolo Harena federations in Fianarantsoa. For a timely preparation of the rice campaign, these Federations decided, on their own initiative, to recycle CRP funds in order to purchase 95 weeding machines and NPK fertilizers. This initiative made it possible for Kolo Harena to get reduced purchase prices and satisfy more effectively the members' needs for agricultural inputs. With the recycling of CRP funds, the Kolo Harena management committees are restarting a revolving fund mechanism entirely managed by the agricultural input supply centers. The objective to set up an autonomous financing relay is respected insofar as the federations conform to the minimum rules for a good management of funds.

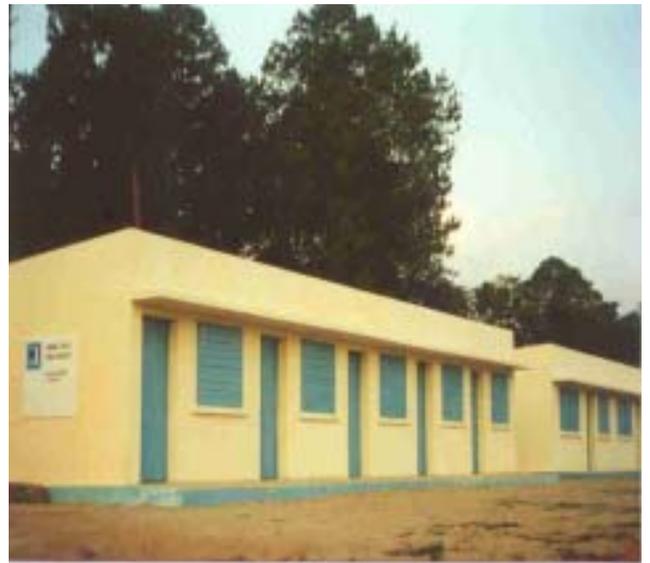
<sup>1</sup> The building of the 4 Agricultural Input Supply Centers in the region of Moramanga is funded under the Toamasina province budget

## **The communes could start large works funded by other donors**

After the cyclones crossed the region, there was a risk of inundation of the town of Ranomafana at the slightest rise of the Namorona river because of the degradation of the earth embankment dating back to 1960. Consequently, the commune decided that the reconstruction of the protection dam was to be included in the priority activities of the cyclone preparedness and response plan.

The project PAICAL<sup>2</sup> funded by the European Union estimated the total cost of works at MGF 213 million, and the contribution of the commune was to cover 25% of the total amount of construction works. The commune lacked the budget necessary and therefore asked for an LDI contribution to purchase 1400 rubble stones. Works started in August and will be completed by the end of December at the latest. Since the dam is part of the commune's heritage, it was agreed that its repair and maintenance should be supported by the commune as part of its internal organization.

Another initiative in the rural commune of Ambalakindresy illustrates the efficiency of LDI financing negotiations with other donors and the relevance of material support provided to the communes vis-à-vis cyclone risks. The construction of a reliable shelter is the priority of the community in the implementation of the cyclone preparedness and response plan. The commune also considered it better to organize the market by taking several measures: observation of hygiene rules; incentive for merchants to pay market fees; improvement of the commune's budget revenue; increase in product exchanges in the market. The commune asked for financing of MGF 226 million from the project PAICAL to carry out the construction of a communal market. In order to start construction works, LDI supported the cost of 57 corrugated iron sheets to supplement the communal contribution. The works were completed in September 2002. The tasks related to market management, repair and maintenance are organized and distributed by mutual agreement to the various entities of the commune. The market is used as a shelter for disaster victims in the event of cyclones.



*The communal market of Ambalakindresy is used as a shelter during the cyclone period*

## **LESSONS LEARNED**

### **The efficiency of the implementation of a cyclone response plan relies upon a participative diagnosis of problems and the identification of priority needs.**

The importance of the recipients' willingness to participate right from the beginning of the decision-making process led to the true appropriation of works to be carried out. As a matter of fact, the organizational structures, which condition the sustainability of activities undertaken or of infrastructures, were gradually established. Such organizational aspects concern *inter alia* a good distribution of tasks, a better cohesion of community members, the respect of everyone's obligations with regard to the maintenance and repair of the infrastructures constructed. Nevertheless, the community's willingness should be accompanied by capacity-building actions to better eliminate the barriers to autonomous management.

---

<sup>2</sup> Programme d'Appui aux Initiatives Communales et des Associations locales

**Follow-up measures to be supported in order to ensure the autonomy of existing organizational structures.**

Following the rehabilitation of several perimeters, Kolo Harena set off the extension of the improved low-lying areas (73 % in the first year) in association with AUEs. The development of these new areas also increased rapidly the profitability of the rehabilitation project compared to the initial investment. Thus, in those areas where hydro-agricultural works were rehabilitated, the program witnesses a reduction in the advance of arable lands into natural forests, in parallel with the improvement of rice fields which lay fallow for a long time. Because of the limited resources, the field staff had to call upon the services of peasant extension workers (*"paysans vulgarisateurs"*) to supervise the growing number of Kolo Harena farmers who request technical assistance in modern rice growing.



*The improved techniques of rice growing (SRI/SRA) are applied on 31% of ricefields*

The future of Kolo Harena associations stemming from the AUEs, and the rational use of the rehabilitated perimeters will certainly depend on the reinforcement of the supervision structure by the *"paysans vulgarisateurs"* and socio-organizers. The LDI team continues being creative and realistic in order to make relay structures rapidly operational upon completion of the project.

**The Cyclone Recovery Program developed the relationships with the communes of intervention.**

The communes could see very clearly the fruits of the collaboration with the LDI program through the rehabilitation of infrastructures and the implementation of the 14 cyclone preparedness and response plans. LDI ensured that the communal governments were consulted from the beginning of the decision-making process to the phase of realization and acceptance of rehabilitated works. A climate of confidence is thus emerging between a number of communes and LDI program as a result of the respect of commitments entered into by LDI vis-à-vis the communes and the integration of local governments into the project financing and implementation process. Getting local governments to integrate themselves into the financing process remains a key element in building the capacity of recipients in order to create reflexes for planning, financing search and project appropriation at the commune level.

**1.1 Rehabilitation of Productive Infrastructure and Systems**

**1.1.1 Irrigation Infrastructure Rehabilitation**

**Table 1: Work completed - Tranche II**

Strategic Zone of Intervention	Sites	Surface Rehabilitated (ha)	No. Beneficiaries AUE/KH	Activity Commencement Date	Completion Percentage
1. <i>Corridor Centre :</i> Tolongoina	1-Madiorano	100	68	October 2001	100%
	2-Ambodivanana	140	57	October 2001	100%
2. <i>Corridor Centre :</i> Ikongo	1-Fiovana	123	37	October 2001	100%
3. <i>Corridor Sud :</i> Miarinarivo	1-Andangovato – Angodongodona	150	28	06 June 2001	100%
	2-Vatovolahy	70	32	October 2001	100%
	3-Ampihimenarambo	120	56	October 2001	100%
<b>Total</b>		<b>703</b>	<b>278</b>		

Lastly, hydro-agricultural rehabilitation works were conducted in six perimeters, resulting in approximately 703 ha of exploitable surface. The new areas rehabilitated downstream from the dam further reinforced water control by farmers, and also enhanced the intensive supervision provided by field agents and *“paysans vulgarisateurs”*. Consequently, 73% was exploited during the first year by the 278 family members of AUEs.

All these rehabilitation works were completed in time despite the crisis which prevailed during the first half of 2002. The last additional rehabilitation works in 2 perimeters in Tolongoina were completed and final acceptance was confirmed. These works reinforced the protection of infrastructures against *lavaka* progression in the surrounding area as well as flooding during the rainy period.



*A general view of rehabilitation works in Andreanavo, Miarinarivo*

The Program also studied the profitability of investment and the sustainability of the infrastructure constructed. The consulting firm CNEAGR and LDI socio-organizers participated in the training in hydro-agricultural work maintenance techniques and training in organization provided to AUE members. The realization of maintenance activities before the beginning of the crop season was included in the training program. The training costs were supported by LDI regular funds, as the funds of the second allotment were limited.

### **1.1.2 Seed Distribution**

The final situation of short cycle seed distribution in Fianarantsoa is limited to 21.9 tons because of the insufficiency of funds allocated to additional purchases of seeds.

- 8 MT of beans;
- 11.7 MT of potatoes;
- 2.2MT of maize.

### 1.1.3 Community-based FCE Rehabilitation

The community-based FCE rehabilitation program has been a remarkable success that now attracts international attention of railroad specialists. The FCE is one of the few railroads in the world that has successfully incorporated community involvement in the rehabilitation of the public lands along the railroad tracks. The success of this program has attracted the new privatized northern railroad in Madagascar, MADARAIL, and this company is now incorporating the model established by the cyclone recovery program in its new investment program.

The Tranche II funding permitted the engagement of the non-governmental organization, Haona Soa, to work with an additional 95 farmers during the second year of the program. As reported in previous reports, the funding led to an impressive set of achievements among the 14 villages covered by the program. The Tranche II funding contributed to the refinement of the conceptual and practical foundations of the community approach to rehabilitation of lands along the railway line. From this solid foundation, the USAID funded FCER project was able to expand subsequently the program to now involve a total of 450 villagers.

The technical approach promoted during the first and second phases led to the adoption of technical innovations far beyond the purvey of the project. Farmers living far from the railway are now copying the techniques of soil stabilization using vetiver grasses intercropped with fruit and spice trees. LDI and other projects visit frequently the sites along the railway as part of farmer-to-farmer exchanges. Most importantly, LDI now buys vetiver from the farmers involved in the community railway rehabilitation effort. These farmers have recorded many millions of francs of sales.

### 1.1.4 Disaster Preparedness and Response Planning

Among the 14 communes covered by this component, 6 communes receive support from the project PSDR in the development of Communal Development Plans (CPD) through LDI interventions which generated this co-financing. In addition, 5 other communes which opted for direct supports received the equipment purchased with second allotment funds, including metal dugouts, metal beds for a basic health center in the commune, corrugated iron sheets for a communal market, and rubble stones for a protection dam. Construction works will be completed in December at the latest.

The results of the support provided by LDI to the 14 communes of intervention are summarized as follows:

- € 14 cyclone preparedness and response plans were developed
- € 5 priority activities in 5 communes received financial support through the implementation of their cyclone plan.
- € Thanks to a co-financing generated by the LDI program, 6 communes could obtain funds from the PSDR in terms of CDP development.
- € Other activities proposed in the cyclone response plans of 7 communes are under review and will probably be financed depending on budget availability under the regular program.



*Ambolomadinika: enthusiastic recipients water the new dugout canoe*

The present situation is summarized in the table 2 below.

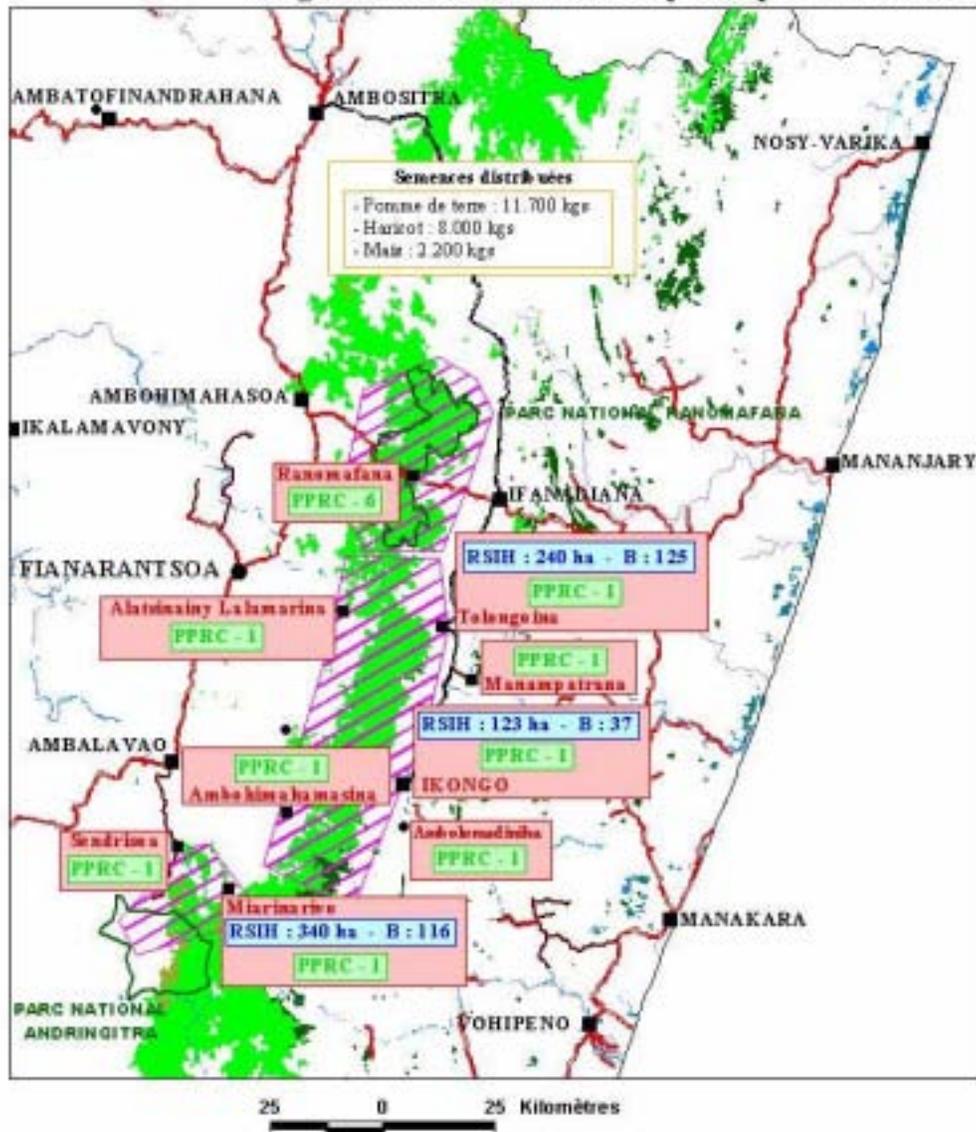
<b>SZI</b>	<b>Commune</b>	<b>Propositions to Employ the \$760 Allocated for Each Commune</b>	<b>Advancement per Commune</b>
<b>Northern Corridor</b>	<b>Morafeno</b>	Contribution of the commune to the construction of a maternity center.	Dossier being analyzed.
	<b>Ambalakindresy</b>	Contribution of the commune to the construction of a communal market that can be used as shelters during cyclones. Total cost : 226 million Fmg.	57 corrugated roofs delivered. Works finalized in October 2002.
	<b>Androy</b>	€ Rehabilitation of the Andaobato bridge. € Rehabilitation of potable water supply.	The PSDR agreed to support the PCD process. Rehabilitation study on-going.
	<b>Ranomafana</b>	Contribution of the commune to the construction of a ditch protecting the low-lands financed by the European Union	1400 moellons delivered to the commune. The works will be finished by the end of December, 2002.
	<b>Kelilalina</b>	Acquisition of a pirogue for the commune	Pirogue delivered and operational.
	<b>Tsatanana</b>	Acquisition of metallic bedframes for the CSB II hospital.	5 metallic bedframes delivered to the hospital.
<b>Central Corridor</b>	<b>Ialamarina</b>	Acquisition of metallic bedframes for the CSB II hospital.	The commune set a priority to the establishment of the PCD. Dossier sent to the PSDR received favorable approval.
	<b>Tolongoina</b>	Construction of a public school.	The commune set a priority to the establishment of the PCD. Dossier sent to the PSDR received favorable approval.
	<b>Manampatrana</b>	Construction of potable water supply.	Relaunch of the collaboration with CARITAS to finance the project. Dossier of establishment of a PCD sent to the PSDR received favorable approval.
	<b>Ikongo</b>	€ Contribution of the commune to the rehabilitation of a meeting room that can be used as shelter during cyclone period.	The commune set a priority to the establishment of the PCD before venturing in other projects. Dossier sent to the PSDR received favorable approval.
	<b>Ambolomadinika</b>	Acquisition of a pirogue for the commune.	Pirogue delivered and operational.
	<b>Ambohimahamasina</b>	The letter of request for funding was not transmitted to LDI.	A letter reminding the deadline for submitting project proposal was sent to the commune.
<b>Southern Corridor</b>	<b>Miarinarivo</b>	Construction of wells in Angalampona and Andohanisoa villages.	The commune set a priority to the establishment of the PCD before venturing in other projects. Dossier sent to the PSDR received favorable approval.
	<b>Sendrisoa</b>	Construction of a trail 44 meters long.	Study in process.

**Table 3 : Summary of Activities - Tranche II Fianarantsoa**

<b>Activity</b>	<b>Work Completed by 30 June 2001</b>	<b>Work Completed by December 15, 2002</b>
<b>Rehabilitation of productive infrastructure and systems</b>		
Irrigation infrastructure rehabilitation	0	703 ha
Seed distribution	0	21.9 metric tons
No. of Beneficiaries	1610 <sup>3</sup>	278
Number of farmer associations	0	6 AUE/KH
FCE Community-based component	0 farmer	158 farmers
<b>Disaster preparedness and response planning</b>		
Number of Assisted Communes	0	14

<sup>3</sup> These 1610 beneficiaries belong to the sites NOT to be rehabilitated in view of cost-benefit considerations (cf september 2001 report page 11)

RÉGION DE FIANARANTSOA  
Programme de réhabilitation cyclonique - Tranche II



Sources : FTB, ANGAP, LDI, MEF



LÉGENDE	
●	Chef-lieu de Fianarantsoa
■	Chef-lieu de Fivondronana
■	Chef-lieu de Fivatsara
□	Aire Protégée
▨	ZEI
▭	Zone d'intervention
—	Route Nationale
—	Route Départementale
—	Autoroute
—	Chemin de fer FCE
—	Hydrographie
—	Limite de fief
Écosystèmes prioritaires	
■	Forêt littorale
■	Forêt dense humide de basse altitude
■	Forêt dense humide de moyenne altitude
■	Forêt dense humide de montagne
■	Mariage
■	Plan d'eau
Type d'activités	
■	RSIH : Réhabilitation des systèmes et infrastructures hydrographiques
■	B : Bénéficiaires
■	PPRC : Plans de préparation et de réponse aux cyclones

Décembre, 2002.



## 2. MORAMANGA

The cyclone recovery program is aimed at restarting the rural economy, which was strongly affected by the damage caused by the cyclones Eline and Gloria in 2000. Interventions are focused on areas with high pressures on natural resources. The second allotment of the Program covered by this report was mainly devoted to the rehabilitation of irrigated perimeters; short cycle seed supply; farmer organization and delivery of technical assistance to recipients. The Program also provided support to those communes located in areas highly vulnerable and frequently affected by natural disasters through the development of the cyclone preparedness and response plans.

### SUCCESS STORIES

Cyclone recovery program – Rejuvenation of rural production – “*Terroir*” approaches

His name: Mr. Roger. His village: Ambodivoapaka, 5km west of the town Fénériver-Est. His association: Kolo Harena Fiaro.

10 years ago, Mr. Roger returned to the 22 ha-family land which includes depressions and catchment areas. The family owned a few litchi and clove plants which existed for several years. The devastating effects of cyclones during the year 2000 affected his farm among many others.

When the LDI program began its activities in the region of Fénériver-Est, Mr. Roger immediately joined the Kolo Harena movement. He converted the depressions into rice fields and adopted SRA techniques. In view of agricultural diversification, and with technical support from the project technician, he started to grow 10 000 pineapple stumps along the slope. With his harvest, he can supply the hotels and large stores in Fénériver-Est with pineapple juice. The market consumes over 100 liters of juice per day during cash crop harvest time (litchi and clove). Owing to his dynamism, he was put in charge of the tree nursery and appointed peasant agriculture extension worker (“*paysan vulgarisateur*”) by the members of his association. He received training in the maintenance of tree nurseries as well as SRA/SRI and fish farming. With the help of KH farmers, Mr. Roger established a nursery for cash crops with technical assistance from LDI and its partner CTHT. Some rice fields are converted into fish farming pools and others into rice/fish farming fields. The slope becomes covered with cash crops and various fruit trees. The 10 000 pineapple stumps grow to be 50 000, plus several *corrossol* stumps. As part of the activities for the reconstitution of forested areas, the adjacent hilltop will be covered with tree species useful for energy and construction purposes, in particular *eucalyptus*. Trees were planted along level lines for soil protection. The family farm was gradually transformed into a “demonstration farm” according to the “*terroir*” approach, i.e. conversion of depressions; rational use of slopes; and perennial cover of hilltops. The owner is eager to visit other farmers if not invite them at his place. Mr. Roger hopes to reach the tourist places of Mahambo and Foulpointe with his fruit juices.



*Combining rice-growing and fish farming: the adoption of technical package increased production and generated additional income for the families*

## Rehabilitation of the Irrigation System and Social Organization

Name of perimeter: Ivakaka. Location: north of Amparafaravola on the western bank of the Lake Alaotra. Surface: 1.900 ha. Recipients: 900 families.

The Ivakaka network was built in the 60s. It was managed by the company SOMALAC which supported all the maintenance costs. From the 90s on, farmers had been left to themselves with the dissolution of SOMALAC. At first, the network was damaged during the cyclone of 1997. A ministerial project estimated the rehabilitation works at US\$ 3 million. The recipients, for lack of valid organization, could not entirely pay their contribution, already initiated, and the project came to nothing. The inundations caused by the cyclone Gloria in 2000 worsened the damages by carrying along the derivation work thereby cutting off network supply. For lack of means, the recipients had to resort to bags of sand and earth clods, but the temporary work was carried along every time the water level rose. The whole perimeter was then cultivated with rain crop.

With the approval of the Ministry of Agriculture and the Direction of Rural Engineering, the LDI Moramanga cyclone recovery program took an active interest in the Ivakaka perimeter. A total amount of US\$ 169,000 was invested including US\$ 9,000 of recipient contribution in the form of community work. Suspicious because of their unhappy experience with the previous project, the farmers express their reluctance openly ; some troublemakers even try by all means to ruin the enterprise.

Faithful to its integrated approach, LDI does not limit its intervention to network rehabilitation but deals also with the socio-organizational aspect and proceeds to the fielding of two socio-organizers. In less than four months of work, the previous users associations are reorganized, and 14 new Associations of Water Users –Kolo Harena (AUE/KH) are set up. Encouraged by the progress of the work and the dependability of the LDI team and its partners, the recipients spared no efforts in order to contribute to project completion and participate in network maintenance.



*The rehabilitation of the dam for Ivakaka completed*

After five months of work, the rehabilitation of the Ivakaka perimeter is completed: the network is operational again. The rice campaign 2002-2003 will mark the re-exploitation of the perimeter in its totality. 1 900 ha would be cultivated, and a production of approximately 6000 T is expected, i.e. US\$ 875,000 in term of gross earnings. With LDI support, the AUEs will benefit from improved seed and manure supply at reasonable price. They will also receive support in network management, maintenance and police. LDI technicians, in association with its local technical partner, will provide a close and intensive supervision to some 120 farmers who plan to develop approximately 100 ha in SRA. The objective is to achieve an average yield of 5 tons per hectare during this first campaign. Thanks to water control, the perimeter will also be exploited for off-season market gardening products.

## LESSONS LEARNED

By giving a reasonable priority to the rehabilitation of irrigation systems, it is possible to reduce significantly the cost of rehabilitation works. With an average cost of US\$ 150 per hectare, it is possible to get a return on investments in a few years. Indeed, with a complete and effective technical itinerary, it is possible to obtain a rice yield twice or three times higher than the traditional production. This net increase in production would lead farmers to gradually give up environmentally unfriendly practices.

In addition, conscious of the need to control water for agricultural intensification, farmers begin to take in hand the maintenance of the irrigation network. In order to guarantee the sustainability of the infrastructures, they must participate in community works while paying the fees so as to have the funds necessary for the maintenance works which require the supply of manufactured materials or specific competences. On this point, experience shows that the recovery rate of such fees is always proportional to the production, hence the interdependence between agricultural performance and infrastructures sustainability. As regards the rice production and exports regions in particular, an alternative that may be considered would be the use of part of the discount to finance the maintenance of perimeters.

Experience also shows that a rapid execution of projects is not always compatible with the application of the participatory approach. Therefore, additional long-term actions are sometimes necessary to capitalize investments and make achievements perennial. Such additional actions generally concern farmer organization, capacity building and agricultural intensification.

## IMPACTS

With its cyclone recovery activities, the LDI program works for the revival of food and cash crops in its regions of intervention.

The rehabilitation of irrigation networks undertaken under the second allotment of the program revalorized 2475 ha of rice fields formerly planted with pluvial rice. Thanks to water control only, an increase in rice yield of 800 kg per hectare is expected. This performance can be optimized by the application of improved rice-growing techniques and the use of agricultural inputs. The average yield expected is of 5 tons per hectare. The increase in production will result in a MGF 3 million (US\$ 460) increase in gross earnings per hectare at least.



*The CDIA in Ilaka-Est aims at, inter alia, to revitalize crop cultures and train local farmers*

The Agricultural Intensification Diffusion Center of Ilaka-Est, in the Vatomandry SZI, which was rehabilitated during the Tranche-II of the program, currently plays its role of place of production, demonstration and training. A site is thus reserved to the demonstration of the “*terroir*” approach with one section covered with cash crops and another reserved for fish farming and rice growing.

The nursery produces young seedlings aimed at satisfying not only the center’s needs but also those of farmers in the region. The revitalization of cash crops is part of the support activities specifically provided by LDI to the east littoral from Vatomandry to Fénériver-Est. The species concerned include ginger, clove and litchi.



*Rehabilitated housing of the Ilaka Est Centre de Diffusion pour l'intensification Agricole (CDIA)*

The supply of agricultural inputs to Kolo Harena is possible thanks to the revolving funds made up from the sales subsidized by the initial stocks provided by the program. The use of qualified seeds not only improves agricultural yield but contributes also to the renewal of the genetic stock. In this respect, the introduction of new seeds in the Lake Alaotra region made it possible to stop the development cycle of the *pyriculariosis* virus on supervised farmers’ plots.

Within the framework of the support to communities affected by cyclones, the disaster preparedness and response plans made available to local leaders currently constitute working tools to be submitted to potential donors (stakeholders).

In general, the Program’s support was an opportunity for recipients to revitalize, diversify, modernize and improve their farms. Grouped within formal associations named Kolo Harena, they can benefit from the experience and support of the traditional LDI program. In addition, they gradually become capable of negotiating and working with other donors such as the PSDR. The efficiency of the approach adopted is proven at farmer level by the great number of requests to join the associations. On the other donors’ side, the originality of the Program’s approaches is an experience to be taken into account in the formulation of their future projects. The LDI Program is among the very rare projects to have rehabilitated large irrigated perimeters in the last few years.

In the case of the “*Gouvernorat*” of Tamatave in particular, the donors were persuaded by the Program’s approach and agreed to co-finance the construction of 4 agricultural input supply centers.

## 2.1 Rehabilitation of productive infrastructure and systems

### 2.1.1 Irrigation system rehabilitation

Within the framework of the rehabilitation of irrigation systems, dams and channel networks were rehabilitated in 5 perimeters. Despite the national economic situation of 2002, the works could be completed in time. A total of 2475 ha of arable lands were recovered for over 2000 needy families upon completion of rehabilitation works.

For an effective valorization of rehabilitation works, the LDI program also provides organizational and technical assistance to farmers. The latter are trained and supervised in the application of the Intensified rice-growing system (SRI) and Improved rice-growing system (SRA), of off-season

cultures, etc. Training sessions are organized within Kolo Harena Associations (KH) and Water Users Associations (AUE).

### Synthesis of irrigation rehabilitation work – Second allotment FRC

**Table 4: Completed Work – FRC Second allotment**

Strategic Zone of Interventions (ZSI)	Irrigation system	Area (ha)	# of beneficiaries AUE/KH
Fenerive	Iazafo Lanary	130	200
Antanandava	Amparihitsokatra	80	50
Vatomandry	Ampitakihosy	350	1000
Ambatovy	Ambohivitsy	15	27
Lac Alaotra	Ivakaka	1900	900
<b>Total</b>		<b>2475</b>	<b>2177</b>

#### 2.1.2 Construction of agricultural input supply centers

Thanks to the co-financing of the “*Gouvernorat*” of Tamatave, 3 supply centers were built in Ranomafana and Ilaka-Est in the Brickaville-Vatomandry SZI, in Maromitety in Fénériver-Est SZI. In the case of Lovoka in the Antanandava ZSI, the construction is nearing completion now.



#### 2.1.3 Seed Distribution

102.9 T of improved seeds were delivered in the six SZIs of the Province of Tamatave under the second allotment of the Program. The breakdown is presented in the following table 5:

Varieties	Quantity (T)	ABV	ATV	BFR	BR-VTM	FVE	LA
Rice	58.14	2.3	5.7	0.35	25.5	3.19	21.1
Potatoes	14.2	5.2	7	0.3			1.7
Beans	10.76	0.3	2.4	1.1	4.06	0.5	2.4
Ginger	19.41			9.51	3.2	6.7	
Others	0.4					0.4	
<b>TOTAL</b>	<b>102.91</b>	<b>7.8</b>	<b>15.1</b>	<b>11.26</b>	<b>32.76</b>	<b>10.79</b>	<b>25.2</b>

ABV : Ambatovy

BR-VTM : Brickaville-Vatomandry

ATV : Antanandava

FVE : Fénériver

BFR : Beforona

LA : Lac Alaotra

#### 2.2 Disaster preparedness and response planning

16 communes received support from the Program in the development of cyclone preparedness and response plans. The plan was developed with the concerned parties using a participatory approach. It identifies the impacts of cyclones and the mitigation measure to be taken. In order to face the next seasons, brochures on precautions to be taken before, during and after the cyclone were distributed to these communes. The communes and *Fokontany* of the sub-prefecture of Vatomandry also received manually powered radio transmitters offered by the

Program, which were intended to ensure the communication with the population in remote areas during the cyclone season.

**Table 6: Summary of activities funded under the FRC Second allotment – Moramanga**

Nature of work	Completed work as of June 30, 2001	Completed work as of December 15, 2002
<b>Rehabilitation of productive infrastructure and systems</b>		
Irrigation infrastructure rehabilitation	80 ha	2475 ha
Construction of agricultural input supply center	0	4
Seed distribution	39.539 tons	102.9 tons
Number of beneficiaries	652	3198
Number of farmer associations	54 KH 1 AUE/KH	101 KH 18 AUE/KH
Disaster preparedness and response planning		
Number of communities assisted	16	16

### **3. Summary of Second Allotment FRC funding Fianarantsoa and Moramanga**

Nature of work	Completed work as of June 30, 2001	Completed work as of December 15, 2002
<b>Rehabilitation of productive infrastructure and systems</b>		
Irrigation infrastructure rehabilitation	80 ha	3178 ha
Construction of agricultural input supply center	0	4
Seed distribution	39.539 tons	124.8 tons
Number of beneficiaries	2262	3476
Number of farmer associations	54 KH 1 AUE/KH	101 KH 24 AUE/KH
FCE Community-based component	0	158 farmers
Disaster preparedness and response planning		
Number of communities assisted	16	30